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On the VARIATION *of* PRICES *and the* VALUE *of the* CURRENCY *since* 1782. *By* W. STANLEY JEVONS, M.A., *Professor of Political Economy in Queen's College, Liverpool.*

[Read before the Statistical Society, May, 1865.]

THE results which I wish to state in this paper were obtained by applying more extensively the method of investigation employed in a pamphlet on the "Value of Gold," published by me about two years ago.

Although my purpose then was only to ascertain the much questioned effect of the gold discoveries, a review of the prices of a period of twenty years seemed hardly sufficient even for that object. We cannot safely assert a given change of prices to be occasioned by an alteration in the supply of gold, unless we observe the general course of prices for a considerable period, and show that there was an *unusual change* in the course of prices subsequent to an *unusual change* in the supply of gold.

Nor do I think it useless when assisted by a distinct method of inquiry to go still further back, and bring into question the course of prices at the beginning of this century. No one, indeed, who knows the division of opinion which existed on this subject, the hundreds of publications it called forth, and the incessant discussions it created, would wish uselessly to raise the subject into debate again. But I think that a true understanding of the course of prices can alone explain many facts in the statistical and commercial history of the country.

It is true that we have Mr. Tooke's "History of Prices," a unique work, of which we can hardly over-estimate the value. But it has struck me that Mr. Tooke, and other writers on the subject of prices, were in want of some method of reducing their tables of prices, and eliciting the general facts contained in them. Large tables of figures are but a mass of confused information for those casually looking into them. They will probably be the source of error to those who pick out a few figures only; a systematic but probably tedious course of calculation and reduction is necessary to their safe and complete use.

My inquiry has accordingly consisted in applying such a method of reduction to the tables of prices contained in the "History " of Prices" by Tooke and Newmarch, extending, with little interruption, from 1782 to recent years, the purpose being to ascertain the course of prices of commodities generally, or of any distinct class of commodities separately.

The method of reduction used, consists in calculating the ratios of change of prices year after year, and then taking, by the aid of logarithms, the *geometric mean ratio of change of prices for each year*. The reasons for adopting the geometric mean were explained in my pamphlet,* and I still think those reasons sufficient. I must mention, however, that the method has been called in question by Dr. E. Laspeyres, Professor in the University of Basle, who has published† a complete and very valuable investigation concerning prices in Hamburg, including a review of some English writings, and of the previous labours of Sœtbeer in the same subject. Dr. Laspeyres urges, if I read him aright, that as the value of gold means its *purchasing power*, we ought to take the simple arithmetic average of the quantities of gold necessary for purchasing uniform quantities of given commodities. There is certainly some ground for the argument. But it may equally be urged that we should suppose a certain uniform quantity of gold to be expended in equal portions in the purchase of certain commodities, and that we ought to take the average quantity purchased each year. This might be ascertained by taking the *harmonic mean.* Thus there are no less than three different averages which might be drawn.

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* The following is the passage referred to:—

"There is no such thing as an average of prices at any one time. If a ton of bar-iron costs *6l.*, and a quarter of corn *3l.*, there is no such relation or similarity between a ton of iron and a quarter of corn as can warrant us in drawing an average between *6l.* and *3l.*; and so of other articles. If at a subsequent time a ton of iron costs *9l.*, and a quarter of corn *3l.* *12s.*, there is again no average between these qualities. We may, however, say that iron has risen 50 per cent., or by one half; what was 100 has become 150; corn has risen 20 per cent, or by one-fifth; what was 100 has become 120. Now the ratio 100 : 150 and 100 : 120, are things of the same kind, but of different amount, between which we can take an average.

This average percentage or ratio must be not the arithmetic but the geometric average * * * * * * * * *
In common business matters it would be sufficient to take the simpler arithmetic mean in place of the other, and neglect the errors. But that cannot be done in the present inquiry, where our alterations of prices have a large range from more than 50 per cent. decrease to more than 100 per cent. increase. Thus the price of cocoa has nearly doubled since 1845-50. It has increased by 100 per cent., so that it is now nearly 200. Cloves, on the contrary, have fallen 50 per cent., and are now at 50. The arithmetic mean of these would be $\frac{200+50}{2}$ or 125. The average rise of cocoa and cloves would then appear to be 25 per cent. But this is totally erroneous. The geometric mean of the ratio 200 and 50, or which is the same of 2 and $\frac{1}{2}$, is 100 or 1. On an average of cocoa and cloves there has been no alteration of price whatever. * * * * A corresponding error of less amount would be committed in every case, did we take the simple arithmetic mean of percentages. The general result would be greatly to exaggerate the prices which have risen at the expense of those which have fallen."

"Serious fall in the value of gold, &c." pp. 6, 7.

† Hildebrand's "Jahrbuch von Nationaloekonomie," Bd. iii, s. 81, &c.

Suppose, for example, that the price a of one commodity change to b, and the price p of another commodity change to q, then the arithmetic mean ratio of change which Dr. Laspeyres would adopt is

$$\frac{\frac{b}{a} + \frac{q}{p}}{2}, \text{ or } \frac{bp + aq}{2\,ap}.$$

The geometric mean is $\sqrt{\frac{b}{a} \times \frac{q}{p}}$.

The harmonic mean would be $\dfrac{1}{\dfrac{\frac{a}{b} + \frac{p}{q}}{2}}$ or $\dfrac{2\,bq}{aq + bp}$.

Suppose one commodity to remain unchanged in price ($a = 1$, $b = 1$), the other to be doubled ($p = 1$, $q = 2$), the mean rise of price might thus be variously stated:—

	Per Cent.
Arithmetic mean	50
Geometric "	41
Harmonic "	33

It is probable that each of these is right for its own purposes when these are more clearly understood in theory. But for the present approximate results I adopt the geometric mean, because (1) it lies between the other two; (2) it presents facilities for the calculation and correction of results by the continual use of logarithms, without which the inquiry could hardly be undertaken; (3) it seems likely to give in the most accurate manner such general change in prices as is due to a change on the part of gold. For any change in gold will affect all prices in an equal ratio; and if other disturbing causes may be considered proportional to the ratio of change of price they produce in one or more commodities, then all the individual variations of prices will be correctly balanced off against each other in the geometric mean, and the true variation of the value of gold will be detected.

In any case my tables will present a sufficient first approximation, and the striking phenomena detected will be under estimated rather than over estimated by my calculations. Thus the general rise of prices between 1845-50 and 1860-62, which I had estimated at 10·25 per cent.,* would have been, according to Dr. Laspeyres, 13·1 per cent., calculated on the arithmetic mean.†

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* "A Serious Fall," &c., p. 29.

† "Hamburger Waarenpreise," &c. Hildebrand's "Jahrbuch," &c., Bd. iii, s. 97.

Calculations of this kind are far from being advocated now for the first time. Not to speak of Sir George Shuckburgh Evelyn's well known paper in the "Philosophical Transactions" for 1798 (part i, p. 176), it was proposed, more than thirty years ago, "to "correct the legal standard of value (or at least, to afford to individuals the means of ascertaining its errors), by the periodical "publication of an authentic price current, containing a list of a "large number of articles in general use, arranged in quantities "corresponding to their relative consumption, so as to give the rise "or fall, from time to time, of the mean of prices; which will "indicate, with all the exactness desirable for commercial purposes, "the variations in the value of money; and enable individuals, if "they shall think fit, to regulate their pecuniary engagements by "reference to this *tabular standard*."*

Such a proposal, though scarcely practicable, is interesting, and perhaps sound in a theoretical point of view.

• I may add, that I had almost completed my calculations before I found that no less an authority than Mr. G. R. Porter had distinctly advocated and adopted a similar method. In the first edition of his "Progress of the Nation,"† he proposes the formation of extensive tables of prices, but adds:—"It is not meant by this to recommend "a mere record of the prices of goods, such as would be afforded by "a collection of prices current, but a calculation conducted upon "the plan already described, or some other that should be equivalent "to it, and which would afford, on inspection, a correct comparative "view of the average fluctuations that should occur." Mr. Porter actually publishes ‡ such a table, giving for each month, 1833-37, the average ratio of variation (probably the arithmetic average) of the prices of fifty commodities. The tables greatly exaggerate the fluctuations compared with my tables, as may be seen in the following:—

Comparative Prices in the Month of March.

Year.	PORTER. Fifty Articles.	JEVONS. Forty Articles.
1833	100	100
'34	110	103
'35	117	104
'36	128	114
'37	125	111

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* "Principles of Political Economy," by G. Poulett Scrope, M.P., London, 1833, p. 406.

† Vol. ii, p. 235.

‡ Ibid., vol. ii, pp. 236, 237.

This subject of mean prices was again considered in a most curious mathematical pamphlet "On Currency," anonymously published in the year 1840.* Several able articles, too, by M. Levasseur in the "Journal des Economistes," bear upon the subject.

I come now to the actual construction of my tables. I selected from Mr. Tooke's tables about forty of the chief commodities, including the official prices of corn, and the prices of butchers' meat and fodder. The particulars are stated in the appendix. A single quotation having been obtained for each year, in the case of some commodities, a yearly average, but in general the medium of the highest and lowest prices in the March quotations of Mr. Tooke's tables, the ratio of each yearly price to that of the preceding year was calculated in logarithms, as in the following example:—

Price of Wheat.

Year.	Yearly Price.			Logarithm of Number of Pence.	Difference.
	£	*s.*	*d.*		
1782	2	9	3	0·772	—
'83	2	14	3	0·814	0·042
'84	2	10	4	0·781	$\bar{1}$·967
'85	2	3	1	0·714	$\bar{1}$·933
'86	2	-	-	0·681	$\bar{1}$·967
'87	2	2	5	0·707	0·026

The logarithm in the third column is obtained by subtracting each logarithm in the second column from the logarithm of the succeeding year. In practice it was more convenient to subtract each logarithm from the preceding one, the reciprocals of the ratios being used all through the calculations until the averages were completed, when they were easily turned back.

Tables of the above form having been made nearly complete for the period of years 1782-1864, for about forty kinds of commodity, the logarithmic ratios for each year were copied out in perpendicular columns, and in an order previously carefully determined on. The several proximate groups were then added up and averaged. By adding together the sums of the first groups, larger groups can readily be formed, and the addition of these gives the final sum of the ratios of the whole forty commodities. The following is an example of the second series of tables:—

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* Knight, London, p. 36.

Prices of Agricultural Produce.

Line.	Commodities.	Logarithmic Ratios of Prices.	
		1832 to 1831.	1833 to 1832.
1	Wheat	·014	$\bar{1}$·947
2	Barley	·067	$\bar{1}$·940
3	Oats	·016	$\bar{1}$·906
4	Rye	·047	$\bar{1}$·937
5	Beans	·042	$\bar{1}$·948
6	Peas	·030	$\bar{1}$·945
7	Hay	$\bar{1}$·945	·033
8	Clover	·020	·038
9	Straw	$\bar{1}$·903	·000
10	Sum of corn (1—6)	·216	$\bar{1}$·623
11	Average of corn	·036	$\bar{1}$·937
12	Sum of fodder (7—9)	$\bar{1}$·868	·071
13	Average of fodder	$\bar{1}$·956	·024
14	Sum of corn and fodder (10, 12)	·084	$\bar{1}$·694

The averages thus determined, however, only give the ratio of prices each year to those of the preceding year. To get the complete and continuous course of prices of any set of commodities, we must join on the separate yearly ratios to each other year after year, by the simple addition of the logarithms, as in the following example:—

Prices of Metals, Copper, Lead, Tin Iron.

Year.	Ratio of Prices each Year to those of the Preceding Year.	Ratio of Prices each Year to Prices of 1782.	
	Logarithm.	Logarithm.	Common Number.
1782	0·000	0·000	100
'83	$\bar{1}$·999	$\bar{1}$·999	100
'84	$\bar{1}$·957	$\bar{1}$·956	90
'85	$\bar{1}$·995	$\bar{1}$·951	89
'86	0·026	$\bar{1}$·977	95
'87	$\bar{1}$·992	$\bar{1}$·969	93
'88	0·011	$\bar{1}$·980	96

In the third column each number is found by adding the preceding number to the number of the succeeding year in the second column, as for instance:—

$$\bar{1}{\cdot}977 = \bar{1}{\cdot}951 + {\cdot}026.$$

A difficulty arises concerning the classification of commodities, that there is no single system of groups into which they naturally fall. It may always be objected that any one arrangement is arbitrary. The fact is, that a mass of forty commodities may be classified in a great number of ways. The principle I adopted, therefore, was to try all systems of classification which seemed to be founded on any material distinctions; in short, to try as many different systems as I could, and then to adopt any which seemed to elicit important information.

The first proximate grouping was nearly that adopted in my gold pamphlet, and in most other arrangements it was sufficient to join these groups together.

A complete classification according to *locality of production*, was rendered impossible, because most commodities are produced in several different parts of the world. The natural and impassable division of tropical and temperate regions, however, enables us to separate their respective products, and it will appear that important results may be obtained by considering the products of eastern countries apart from other commodities.

For the period of years, 1800 to 1820, a correction is obviously necessary to reduce prices and their variations to a gold standard. A table is to be found in most works on the currency, giving the depreciation of the Bank of England paper during each of those years, and the authorities for some of these numbers are given in a pamphlet by the Earl of Lauderdale.* These numbers, indeed, bear some internal signs of want of accuracy and reliability, arising, no doubt, from the fact that the depreciation of the currency was not recognised by the law. The prices of silver probably furnish a better criterion of the value of the paper currency, and their variation is shown in Table I (Appendix), calculated from the average variations of the price of standard silver and Spanish dollars, as given in "Tooke's History" (vol. ii, p. 384), and the "Report of "the Bullion Committee, 1810," p. [22]. There is, however, a general accordance between the variation of price of silver and gold, and as it is convenient to keep to a single standard, I have reduced all the tables to the gold standard by the subtraction of the logarithms in column (3) of Table I from the logarithmic ratios of prices in the corresponding years to prices in 1782.

* "Depreciation of the Paper Currency of Great Britain proved," London, 1812.

A further step seemed necessary to present the information contained in these tables in the simplest form. The price of each commodity and group of commodities, varies both from causes peculiar to each commodity, and from causes affecting gold, the measure of value. The latter are common to all, and their effects are more or less truly shown in the general variation of price of all commodities. If then we divide the ratios of variations of individual commodities and partial groups by the ratios of all commodities, which is done by the simple subtraction of the corresponding logarithms, we get the variations peculiar to each commodity or partial group (See Appendix, Table VIII, comparative variations).

The logarithmic ratios thus prepared may be turned back into natural numbers, giving the ratios of prices each year to prices in 1782. But, for most purposes, I should prefer to retain the ratios in their logarithmic form, and represent them to the eye upon a diagram. The diagrams* appended to this paper are thus drawn, and have several advantages over those drawn on the scale of common numbers. Equal perpendicular distances represent equal ratios of change, and straight lines represent numbers in geometric, not in arithmetic, progression. A tendency may be observed in most statistical curves to become divergent, or to run up into excessive elevations. This is easily understood, when we consider that in almost every branch of statistics numbers should be considered relatively to each other, which may most easily be done by representing them on a logarithmic scale.

The datum point to which the numbers in the tables and curves are referred, is given by the prices of the year 1782, the first year of Mr. Tooke's tables. This is a purely arbitrary commencement, and it might seem desirable to substitute for it some carefully selected average of a period of years. But I conceive that when we have the variations of a long series of years presented in a curve, no such datum line is necessary, as the eye easily compares any year or period with any other year or period.

It is impossible here to notice more than a very small part of the information contained in the tables. We notice the tendency of animal and mineral substances to rise in price, and of vegetable substances, at least in this country, to decline.

The curve of the general variation of prices is perhaps the most interesting. In this we detect a series of smaller undulations, riding, as it were, on one very great one. We see elevations of prices probably due to speculation, and reaching their highest points in the years 1796, 1801, 1809, 1814, 1818, 1825, 1836,

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* These diagrams represent the variations of prices in currency, not corrected during the period 1800-1820 for depreciation of the paper currency. In the tables the correction has been made.

1839, 1847 and 1857. The speculation of 1793 is hardly perceptible, and the extraordinary rise of prices in 1825 is chiefly marked by a pause in the very rapid downward course of prices about that time. From 1833 to 1843, there is an elevation of prices of a more extensive character than can well be assigned to speculation alone. Since 1852, lastly, prices have risen in a permanent manner, which points to some effect of the Californian and Australian discoveries.

It is, however, the general form of the undulation of prices which is most remarkable. After the year 1790 an enormous and long-continued elevation presents itself. And when prices had reached their highest, about the year 1809, a still more surprising fall of prices commences, reaching its lowest point in 1849. Between 1809 and 1849, prices fell in the ratio of 100 to 41.

My purpose is to ascertain and measure these great changes with some approach to certainty and accuracy, and to establish them as facts of observation. To explain or account for them is a matter which I do not undertake. I cannot help noticing, however, the insufficiency of all explanations yet given of the state of prices in the early part of the century. Fiercely though the subject was debated, it was impossible at the time, perhaps, to form any adequate notions of the great movement of prices. Some writers laboured to prove that prices were unchanged, and those who were less wrong about the fact were hardly less wrong in attributing that fact to the deranged state of currency and banking at the time. Subsequently Mr. Tooke's "History of Prices" came to be regarded as the authority on the subject. Mr. Tooke's main purpose was to disprove all these notions about the extraordinary influence of currency. He allowed, of course, that the note currency was depreciated in the small degree marked by the increased price of gold bullion. But, beyond this, he would not allow any influence to the derangement of currencies, and what elevation of prices he supposed to exist, was attributed by him to the frequency of bad harvests at the time, or to the derangement by war of the ordinary relations of supply and demand. In these opinions I conceive that Mr. Tooke was partially, and only partially, right. On the one hand, I cannot too fully concur in Mr. Tooke's protest against attributing every evil to the currency, which is a very passive thing, and does not deserve to be made the scape goat it long has been. But, on the other hand, it cannot be denied that the extraordinary issue of Bank of England and private bank notes in England during the suspension of specie payments, drove out a large mass of metallic currency. Other amounts were similarly displaced by the paper currencies of France, Austria, Russia and some other countries. In the aggregate a considerable mass of precious metals must have been thrown on European markets, and to this cause we must assign some part of the elevation of prices. Mr. Jacob,* indeed, argues that this effect of the paper currencies would be inconsiderable, and without attempting to discuss the subject further here, I am quite ready to allow it would only produce a small part of the elevation of prices.

But then I think the cause assigned by Mr. Tooke was equally insufficient, namely, the unusual frequency of bad seasons. I cannot think that Mr. Tooke, when assigning such a cause, was fully aware how great and general was the rise of prices. Bad seasons might well raise the prices of all kinds of corn, fodder, meat and agricultural produce, but could not have any permanent effect upon the prices of other articles. Now, though corn did rise extravagantly in price on several occasions during the period under review, on the whole it did not rise so much as metals, fibres, oils and some other articles. At the most, I think the unusual frequency of bad harvests could only be a partial contributing cause to the general rise.

The elevation of prices in the early part of the century is still more striking when contrasted with the subsequent great fall, proceeding from 1818 to 1830, and reaching its lowest point as yet in 1849. This fall is less difficult to understand. The production of almost all articles has been improved, extended, and cheapened during this period, and all imported articles must, too, have been affected by improvements in navigation, while there was no corresponding improvement in the production of the precious metals, from the derangement of the American mines in 1810 to the Californian discoveries in 1849.

But this argument tells two ways, for manufactories and modes of production were undergoing improvement in the earlier period, while prices were rising, as well as in the latter period, while they were falling. Even our foreign trade suffered no great check during the wars, and the very foundations of our home industries were being energetically laid throughout the period from 1782 to 1815, when prices were high or rising. The progress of our industry, in short, has been continuous, and its only change that of acceleration in recent years. There is nothing in such constant progress that can account for a great rise of price followed by a great fall.

If the progress of invention causes a fall of price, then we need even more potent causes to raise prices in opposition to it in the early part of this century, when invention was most active.

The production of gold, on the other hand, has† been far from uniformly progressive. It progressed up to the beginning of the century, but suffered a serious relapse in 1810, when the American mines were deranged by the Spanish War of Independence. Mr. Jacob estimates the average produce, from 1810 to 1830, at one-half the previous amount, and this failure must be regarded as one of the contributing causes to the fall of prices.

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* "Historical Inquiry into the Production and Consumption of the Precious "Metals," vol. ii, pp. 366—371. Mr. Jacob's opinion is disputed in the "Quarterly Review, No. 94."

† See the diagram prefixed to Stirling's "Gold Discoveries," Edinburgh, 1853.

Further light may, however, be thrown upon the question, whether gold could be said to be depreciated in the early part of this century, by considering the relative prices of the products of different countries and the state of the exchanges. Professor Cairnes has most clearly pointed out the effects of a flood of gold in successively raising prices in the countries into which it flows.* He established theoretically that while the precious metals are copiously flowing, for instance, from this country to India, prices here must be higher than in India; hence all articles will be dear in price here, except those tropical products which we buy from India.

It was, if I recollect aright, noticed by Mr. Newmarch, in the sixth volume of "Tooke's History," that the prices of tropical and some colonial produce had scarcely risen of late years. I encountered the same fact which I stated, being then quite unacquainted with Professor Cairnes' writings on the subject, in the following words:— "All the groups which have fallen in price, are of vegetable origin, "and chiefly of foreign growth,"—and I gave what I thought an obvious, though perhaps mistaken, explanation of "the marked "distinction between the classes of materials which have risen in "price and those of foreign articles of food which have fallen."†

Now when Professor Cairnes read my pamphlet he detected, in this comparative fall of the price of oriental produce, a confirmation of his own theoretical views of the effects of an excess of gold in one country and its motion towards another country. These three facts, (1) a distinct, though moderate general rise of prices here; (2) a drain of bullion to the east; (3) a comparative fall in the price of oriental produce formed, in his opinion, when taken in union, a complete demonstration of some depreciation of gold since the Australian discoveries.

When I had nearly completed the reduction of Mr. Tooke's tables, I could not help being struck by the fact that when prices were highest here, between 1800 and 1815, the prices of eastern produce were not higher than they had been, and consequently in comparison with the prices of other articles had fallen. This fact, according to Professor Cairnes' views, would inevitably point to a comparative redundancy of gold in Europe. I was therefore lead to inquire into the past fluctuations of the current of specie towards the east.

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* "Report of the British Association," 1858; "Dublin Statistical Journal," January, 1859; "Frazer's Magazine," September, 1859, and January, 1860; "Economist," 30th May, 1863.

† "A Serious Fall," &c., p. 31.

It does not seem possible to form any one complete series of accounts of the export of bullion, extending over the whole period of our inquiry, but we may perhaps pretty safely infer the character of the fluctations from tables given in the Appendix.

The current of gold having been very steady during the earlier half of last century, fluctuated a good deal during the second half of the century. It was considerable in the period 1785 to 1791 or 1792; then it fell off very much, and only began to rise again into importance in 1797. In the years 1798, 1799, 1802, 1803, 1804, and 1805, the exports both of the East India Company and of private persons were very great, the exports of the Company at least reaching greater amounts than had ever been known before.

Independent evidence of the increased current of precious metals setting towards the east in the early years of this century, is seen in the table of imports into Bengal, given in Milburn's "Oriental "Commerce." And the later course of the trade is given in the half official tables of Martin's "British Colonies," p. 360, B, &c.*

The current greatly fell off in the period 1806-13, but stood at a very high amount in the years 1814-19. After 1820 the drain decreased very rapidly, and the exports of other merchandise increased, so that about the year 1832 the current of treasure actually turned in the opposite direction for a year or two. With slight exceptions there was then no considerable movement until the Californian and Australian discoveries of gold, which were followed almost immediately by the great drain, unremitted to the present time.

Viewed by itself, the current of specie would not afford any safe criterion of variations in value of gold here. It might easily be asserted that the growth of our trade about the beginning of the century required increased remittances, especially after the opening of the trade to India in 1814; that afterwards the increased export of cotton and other manufactures took the place of treasure. Under this view, however, the recent drain of bullion stands out as unaccountable.

Then again it will probably be said that the great wars were sufficient to account for great remittances of treasure and for interruptions of trade. I am quite willing to allow to such causes all that can be fairly attributed to them, but I cannot regard occasional and temporary events as the causes of long-continued changes of trade.

When we compare the large average exportation of treasure during the period 1798-1820, with the high range of general prices at the time, and the comparatively low price of oriental produce, when we remember that the increased abundance of gold in late years has been accompanied by somewhat increased prices, by an enormous drain of bullion to the east, and again by a low price of oriental produce; and when we observe especially that between these two periods, when prices in general were very rapidly falling, or were low, and oriental produce comparatively high, the drain of bullion was either small or actually reversed, we can hardly help connecting these events as causes and effects.

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* See also Tooke on "High and Low Prices," p. 211.

I am far from asserting, indeed, that there is any exact coincidence between the state of prices and the drain of bullion in the period 1798-1820, that would put the question beyond doubt. The drain for instance was greatest after 1814, when general prices here had already fallen, and the prices of oriental produce had risen. But this discordance is of a kind which might be accounted for by the opening of markets, and by political events. Such events may dislocate and reverse a trade for a few years, but on an average of a long period trade will assert its own character, and deeper causes will produce their effects.

I do not attempt to account for the comparative redundancy and depreciation of gold, which I believe to have existed in Europe in the early part of this century. No single cause that I know of can be sufficient to account for so singular an event. The discovery of the Russian mines, and the increased yield of the Spanish American mines, would contribute something to the observed effects, but would be totally inadequate to their complete explanation. It seems impossible to tell the net effect of the long-continued wars. The displacement of metallic by paper currency, and the diminished sphere for its use by the restriction of trade, would tend to throw quantities of metal on the market. But, on the other hand, the hoarding or sluggish use of currency occasioned by war, and the demand and dispersion of metallic money by armies in the field, would tend to absorb those supplies. It seems impossible to say what the balance would be. I assert, the redundancy of gold in the early part of the century, then, a simple *fact of observation.*

These views of the relation of the eastern drain of treasure to the state of prices here, if accepted, throw considerable light upon the course of prices since the gold discoveries. Those who predicted a revolution in monetary affairs from the great flood of gold, have been thoroughly disappointed. Fifteen years have elapsed, and the diggings have perhaps passed the meridian point of their prosperity without any appearance of a commercial revolution. But those, I conceive, are also wrong who proved there was and could be no depreciation of gold; who even went so far as to assert that gold naturally opens a way for its own employment.

European markets, where expedients for economising currency are in common and growing use, could not possibly absorb the continuous supplies from the diggings without a complete revolution in prices. But no sooner had a certain moderate rise occurred, than the surplus of the precious metals flowed off to the east, where an immense metallic currency, an absence of any modes of economising it, and a general taste for the luxurious use of the precious metals, opens a great sphere for their absorption and consumption. That this current was occasioned by the redundancy of gold, is proved, as Professor Cairnes anticipated, by a low price of oriental produce.* Had it been occasioned by an immense demand here for oriental produce, and a consequent balance of trade outwards, oriental produce would have been comparatively high, not low in price.

Asia, then, is the great reservoir and sink of the precious metals. It has saved us from a commercial revolution, and taken off our hands many millions of bullion which would be worse than useless here. And from the earliest historical ages it has stood in a similar relation to Europe. In the middle ages it relieved Europe of the excess of Spanish American treasure, just as it now relieves us of the excess of Australian treasure. " The Indian trade," says Macpherson,† " arose to considerable magnitude, at the same time that " the American mines began to pour their treasures into Europe, " which happily has been preserved by the exportation of silver to " India, from being overwhelmed by the inundation of the precious " metals, as it must have been had no such exportation taken place." And " Raynal affirms that the Spaniards must have abandoned their " most productive mines of silver in America, as they had already " abandoned many of the less productive ones, if the progress of the " depreciation of silver had not been somewhat retarded by the " exportation of it to India."‡

If the state of prices here, then, depends upon prices in India, we should be backward in making predictions of their future course. But we may perhaps speak with the more confidence of the accomplished results of the gold discoveries. Prices had been falling with little interruption from 1810 to 1849. The years 1836-39 form a temporary but remarkable exception. In 1849-52 prices were unprecedently low, and *cæteris paribus*, we might have expected that after another period of speculation and its corresponding relapse of trade, prices should descend still lower. But prices in 1858 were still 18 per cent. above those of 1852.

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* I had also said (" Serious Fall," &c., p. 37), " having shown upon a wide basis " of facts that both gold and silver are depreciated here, I am much more inclined to " regard this depreciation as the cause of the eastern drain. The fall in the value " of silver, compared with most other goods, makes it more profitable to pay for " eastern produce with silver bullion than with our manufactures, silver being " always acceptable among Asiatic nations."

† " Commerce with India," p. 337.

‡ " Commerce with India," quoting " Histoire Phil. et Pol. des deux Indes," vol. iii, p. 169, edit. 1782.

Since 1858 enormous fluctuations have taken place in the price of many commodities. The price of cotton has been quadrupled and again halved. Corn has fallen to what seems a natural minimum price, and meat and fodder have greatly advanced. There has been a great recent fall, too, in the price of many kinds of imported produce. Yet when the average of all kinds of commodity is struck, we find that prices, since 1858, have been uniform in an unprecedented manner. The average fall since last year has been trifling. If we compare prices now (March, 1865) with what they were at their lowest in 1849, we find there has been a rise of 21 per cent. If we take the average of 1845-50 as our standard of comparison, the rise is 11 per cent. The real permanent rise due to the gold discoveries is doubtless something between these, or probably nearer the higher limit, 21 per cent. The gold discoveries have caused this rise of price. They have also neutralized the fall of prices which might have been expected from the continuous progress of invention and production, but of which the amount is necessarily unknown. It may be confidently asserted, then, that the Californian and Australian discoveries have had a considerable effect in reversing the previous course of prices, but it is impossible to state the amount of that effect with any approach to certainty.

APPENDIX.

I.—*Table showing the Variation of the Prices of Gold and Silver Bullion during the Suspension of Specie Payments at the Bank of England.*

1	2	3	4	5	6
Year.	Price of Gold.	Ratio of Price of Gold to Standard Price.		Ratio of Price of Silver, to the Price of Silver in 1798.	
		Logarithm.	Number.	Number.	Logarithm.
	£ s. d.				
1798 …………	3 17 10½	0·000	100	100	·000
'99 …………	—	0·000	100	103	·014
1800 …………	—	0·000	100	111	·047
'01 …………	4 5 -	0·038	109	115	·060
'02 …………	4 4 -	0·033	108	109	·037
'03 …………	4 - -	0·012	103	108	·033
'04 …………	—	0·012	103	105	·023
1805 …………	—	0·012	103	109	·035
'06 …………	—	0·012	103	108	·032
'07 …………	—	0·012	103	106	·025
'08 …………	—	0·012	103	105	·023
'09 …………	—	0·012	103	106	·025
1810 …………	4 10 -	0·063	116	111	·045
'11 …………	4 4 6	0·036	109	118	·071
'12 …………	4 15 6	0·089	123	122	·088
'13 …………	5 1 -	0·113	130	133	·125
'14 …………	5 4 -	0·126	134	123	·089
1815 …………	4 13 6	0·080	120	105	·022
'16 …………	4 13 6	0·080	120	94	1̄·971
'17 …………	4 - -	0·012	103	91	1̄·960
'18 …………	4 - -	0·012	103	97	1̄·988
'19 …………	4 1 6	0·020	105	99	1̄·994
1820 …………	3 19 11	0·011	103	93	1̄·968
'21 …………	3 17 10½	0·000	100	91	1̄·957

Note.—Column 3 of the above table contains the logarithms by the subtraction of which prices are reduced to a gold standard.

TABLES SHOWING THE VARIATIONS IN THE MOVEMENT OF BULLION TO THE EAST.

II.—*Average Yearly Value of the Exports of Treasure by the East India Company.*

Decennial Period.	Value in Pounds Sterling.
1711-20	434,000
'21-30	532,000
'31-40	487,000
'41-50	631,000
'51-60	571,000
'61-70	152,000
'71-80	43,000
'81-90	393,000
'91-1800	352,000
1801-07	852,000

Note.—The yearly exports of treasure and merchandise, 1711-1807, are given at length in Milburn's "Oriental Commerce," p. 419.

III.—*Average Yearly Amount of Bullion by Weight, Exported by the East India Company and by Private Persons, chiefly Silver.* (See Table V.)

Period.	Ounces.
1791-1800	2,055,000
1801-08	3,781,000

IV.—*Average Yearly Value of Bullion absorbed by the Presidencies of India, being the excess of Imports over Exports.* (See Table VI.)

Period of Years.	Value in Pounds Sterling.
1802-10	1,998,000
'11-20	2,827,000
'21-30	1,333,000
'31-40	1,373,000
'41-50	2,308,000
'51-56	6,320,000

V. — *Table showing the Quantity of Gold and Silver in each Year, 1788-1808, Exported by the East India Company, to China and the East Indies, whether on account of the Company or of Private Persons.*

[0,000's omitted.]

Year.	Millions of Ounces.	Year.	Millions of Ounces.
1788	2,68	1798	3,57
'89	2,15	'99	7,29
1790	4,04	1800	1,38
'91	3,49	'01	2,26
'92	2,92	'02	2,48
'93	,32	'03	7,98
'94	,18	'04	4,08
		1805	8,74
1795	,15	'06	3,43
'96	,29	'07	,36
'97	,96	'08	,92

Note.—Calculated from Account No. IX in the Appendix to the "Report of "the Bullion Committee," 1810.

VI.—*Table showing the Value of the Treasure absorbed in each Year, 1802-1856, by the Three Presidencies of India, being the Excess of Imports from all parts over Exports.*

[0,000's omitted.]

Year.	Value in Millions of Pounds Sterling.	Year.	Value in Millions of Pounds Sterling.
1802-03	1,73	1830-31	,93
'03-04	1,58	'31-32	– ,41
'04-05	2,27	'32-33	– ,32
		'33-34	1,10
1805-06	2,21	'34-35	1,70
'06-07	2,65		
'07-08	2,01	1835-36	2,04
'08-09	1,01	'36-37	1,77
'09-10	2,37	'37-38	2,30
		'38-39	2,66
1810-11	2,15	'39-40	1,47
'11-12	1,07		
'12-13	,87		
'13-14	,62	1840-41	1,42
'14-15	1,21	'41-42	1,33
		'42-43	3,23
1815-16	2,10	'43-44	4,05
'16-17	4,01	'44-45	2,65
'17-18	4,30		
'18-19	6,77	1845-46	1,68
'19-20	4,25	'46-47	2,23
		'47-48	,55
1820-21	3,05	'48-49	1,66
'21-22	1,61	'49-50	2,43
'22-23	2,02		
'23-24	,39	1850-51	3,27
'24-25	,96	'51-52	4,13
		'52-53	5,78
1825-26	1,54	'53-54	3,39
'26-27	1,80	'54-55	,76
'27-28	1,89		
'28-29	1,20	1855-56	10,70
'29-30	,99	'56-57	13,16

Note. — The numbers 1802-33 are reduced from the table in Martin's "British Colonies," p. 360 B. The continuation of the account is from McCulloch's article "Precious Metals" in the "Encyclopœdia Britannica," 8th edit., p. 469.

During the years 1831-32 and 1832-33, there was an excess of exports over imports of 410,000*l.* and 320,000*l.* respectively.

About 1818 there was an unusually large Government remittance to India.

VII.—*List of Commodities treated in the Tables.*

From 1782 to 1844 the prices were mostly taken from Mr. Tooke's tables. After 1844 the average prices, as calculated from the price lists of the "Economist," and printed in my "Serious Fall," &c., p. 21, were mostly used, the commodities being nearly identical with those quoted in Mr. Tooke's tables, and subsequently in the valuable annual review of trade in the "Economist" newspaper. Concerning inconvenient, but unavoidable, changes of quotation, see Mr. Danson's note in Tooke's "History," vol. vi, p. 491. The following list notices the more important variations only.

The brackets indicate the groups of commodities, or else point out where several qualities of one commodity have been joined and averaged before being thrown as one unit into larger groups.

METALS ....
- Copper, tough cakes.
- Lead, British pigs.
- Tin, English bars.
- Iron
  - Pig, Tooke, 1782-94, 1816-39, 1801-32, Matthews's "Report of Commission on Manufactures."
  - Wrought, Russia, 1782-39; Swedish, 1839-56; Swedish steel, 1857-65.
  - Welsh bars, 1806-57, "Serious Fall," &c., p. 12.

OILS................
- Gallipoli, in bond; linseed after 1844.
- Fish; palm after 1844.

Tallow, St. Petersburg.
Tar, Stockholm.

- Ashes, barilla; Carthagena in bond to 1836.
- „ pearl; Dantzic or Russia to 1839.
- „ Canadian pearl, first sort, 1840-45.

TIMBER ....
- Memel fir, in bond.
- Quebec yellow pine, 1784-1806, 1820-39, 1813-21, McCulloch's "Dictionary," Canadian yellow pine, 1856-65.

Hemp, St. Petersburg, clean.

FIBRES ....
- Cotton, upland, 1793
- „ Pernam, 1788
- „ Surat, 1790
  - after 1801, from table in "Exchange "Magazine," October, 1862, or *Journal Statistical Society*, December, 1862.
- „ Surinam, 1782-44; Demerara after 1820.
- Wool, Southdown, average 1784-1845, McCulloch's "Dictionary."
- „ Spanish, South Australian lambs, 1861-65.
- Silk, China, raw.
- „ Reggio, raw, 1844; Italian raw, all descriptions.
- Flax, St. Petersburg.

DYE MATERIALS
- Logwood, Jamaica.
- Indigo, superior and inferior, East India.
- Cochineal, Spanish; Teneriffe after 1861.

VII.—*List of Commodities treated in the Tables—Contd.*

Hides, B.A. and M.V. dry, after 1844.
Leather, crop hides, after 1844.

CORN ....
Wheat, " Gazette " average.
Barley, „
Oats, „
Rye, „
Beans, „
Peas, „ from 1792.

FODDER ....
Hay, " Gentleman's Magazine," 1798.
Clover, „ 1803.
Straw, „ 1798.

MEAT ....
Mutton, St. Thomas's Hospital average.
Beef, „ „
Irish mess beef, after 1848 American and Canadian.
Pork after 1845.

Butter, Waterford, &c.

Sugar, Muscovados, " Gazette " average after 1800.
„ Havannah for exportation, 1801-46.

Tea, congou.
„ hyson.

Coffee, superior British plantation.
„ inferior „
„ St. Domingo for exportation, after 1807.

Spirits, Jamaica rum.

Rice, Carolina, 1782-1839.
Pepper, East India black.
Cinnamon, first quality in bond.
Tobacco, Virginia, in bond.

The following groups are thus composed:—

Oriental Produce.	Tropical Food.
Indigo.	Sugar.
Pepper.	Tea.
Cinnamon.	Coffee.
Tea.	Spirits.
Sugar.	Pepper.
China silk.	Cinnamon.
Surat cotton.	Rice.
	Tobacco.

VIII.—*Proportional Variation of Prices from* 1782.

	General Variation of all the Forty Commodities.			Oriental Products.		Tropical Food.	
	Gold Standard.	Paper Standard.	Gold Standard. Logarithm.	Actual.	Comparative.	Actual.	Comparative.
1782	100	Uncorrected for depreciation (1801-20).	·000	100	100	100	100
'83........	100		·001	101	101	87	87
'84........	93		1̄·966	94	102	82	89
'85........	90		1̄·956	93	103	70	77
1786........	85		1̄·927	82	97	64	76
'87........	87		1̄·941	91	105	70	79
'88	87		1̄·941	91	105	74	84
'89	85		1̄·930	85	100	70	82
'90........	87		1̄·937	80	92	69	80
1791........	89		1̄·947	89	101	72	81
'92........	93		1̄·969	107	115	81	87
'93........	99		1̄·994	96	97	79	80
'94........	98		1̄·989	84	86	72	74
'95........	117		·067	96	82	93	80
1796........	125		·097	105	84	102	82
'97........	110		·043	85	77	87	79
'98	118		·070	107	91	98	83
'99........	130		·113	100	77	86	66
1800........	141		·148	80	57	84	60
1801........	140	153	·147	80	57	73	52
'02........	110	119	·042	74	67	68	62
'03........	125	128	·096	74	60	67	54
'04........	119	122	·074	71	60	64	54
'05........	132	136	·120	79	60	75	57
1806........	130	133	·113	79	61	70	54
'07........	129	132	·110	73	57	63	49
'08........	145	149	·160	84	58	71	49
'09........	157	161	·195	86	55	82	52
'10........	142	164	·152	83	59	75	53
1811........	136	147	·132	74	55	60	44
'12........	121	148	·081	66	55	58	48
'13........	115	149	·060	68	59	67	59
'14........	114	153	·058	90	78	84	73
'15........	109	132	·039	82	75	77	71
1816	91	109	1̄·959	68	75	63	69
'17........	117	120	·067	81	69	77	66
'18........	132	135	·119	90	69	92	70
'19........	112	117	·048	74	66	73	65
'20........	103	106	·013	65	63	67	65

VIII.—*Proportional Variation of Prices—Contd.*

	All Commodities.		Oriental Products.		Tropical Food.	
	Gold Standard.	Logarithm.	Actual.	Comparative.	Actual.	Comparative.
1821.......	94	$\bar{1}$·975	68	72	63	66
'22.......	88	$\bar{1}$·946	67	76	61	70
'23.......	89	$\bar{1}$·948	65	73	62	70
'24.....	88	$\bar{1}$·946	61	69	52	58
'25	103	·014	80	78	65	63
1826	90	$\bar{1}$·953	56	62	55	61
'27.......	90	$\bar{1}$·956	58	64	54	60
'28.......	81	$\bar{1}$·909	53	65	48	60
'29.......	79	$\bar{1}$·899	51	64	49	62
'30.......	81	$\bar{1}$·906	52	64	47	59
1831.......	82	$\bar{1}$·915	49	59	48	58
'32.......	78	$\bar{1}$·893	49	62	50	63
'33.......	75	$\bar{1}$·877	50	67	49	65
'34.......	78	$\bar{1}$·891	53	68	50	64
'35.......	80	$\bar{1}$·905	58	72	51	64
1836	86	$\bar{1}$·935	60	69	54	63
'37.......	84	$\bar{1}$·922	50	60	48	63
'38.......	84	$\bar{1}$·924	53	63	52	62
'39.......	92	$\bar{1}$·965	56	61	61	66
'40.......	87	$\bar{1}$·940	56	64	60	68
1841.......	85	$\bar{1}$·928	51	60	53	63
'42.......	75	$\bar{1}$·875	45	60	46	62
'43.......	71	$\bar{1}$·851	45	64	44	62
'44.......	69	$\bar{1}$·840	42	61	42	60
'45.......	74	$\bar{1}$·867	38	51	40	54
1846	74	$\bar{1}$·871	37	49	38	52
'47.......	78	$\bar{1}$·894	36	46	40	51
'48.......	68	$\bar{1}$·831	31	46	35	52
'49.......	64	$\bar{1}$·806	33	52	36	56
'50.......	64	$\bar{1}$·808	38	59	39	61
1851........	66	$\bar{1}$·817	36	56	41	62
'52.......	65	$\bar{1}$·810	34	53	34	52
'53.......	74	$\bar{1}$·871	36	49	38	52
'54.......	83	$\bar{1}$·919	34	41	40	48
'55.......	80	$\bar{1}$·903	31	39	39	48
1856	82	$\bar{1}$·916	36	44	40	48
'57.......	85	$\bar{1}$·928	39	46	43	51
'58.......	76	$\bar{1}$·878	35	46	37	49
'59.......	77	$\bar{1}$·884	35	46	37	49
'60.......	79	$\bar{1}$·898	30	46	39	50
1861	78	$\bar{1}$·894	36	46	38	49
'62.......	79	$\bar{1}$·900	42	52	39	49
'63.......	78	$\bar{1}$·894	43	55	39	50
'64.......	78	$\bar{1}$·894	44	56	42	53
'65.......	78	$\bar{1}$·890	44	56	42	54

VIII.—*Proportional Variation of Prices from* 1782.

Year.	Metals. Copper, Lead, Tin, Iron.		Iron. Several Varieties.		Timber.		Oils.		Dye Materials.	
	Actual.	Comparative.	Actual.	Comparative.	Actual.	Comparative.	Actual.	Comparative.	Actual.	Comparative.
1782	100	100	100	100	100	100	100	100	100	100
'83	100	100	97	97	108	107	94	94	92	91
'84	90	98	72	78	54	58	96	104	98	106
'85	89	99	67	74	73	81	104	115	90	99
1786	95	112	84	100	58	69	91	107	69	81
'87	93	107	72	82	61	70	87	100	75	86
'88	96	109	73	83	58	67	81	93	78	89
'89	93	109	78	91	58	69	84	98	73	85
'90	92	106	76	87	56	65	88	101	64	74
1791	100	113	92	104	85	96	82	92	77	87
'92	108	116	92	99	73	79	86	92	79	85
'93	113	115	91	92	70	71	103	104	79	80
'94	111	114	94	96	78	80	103	106	81	83
'95	108	93	86	74	108	93	124	106	109	93
1796	117	94	101	81	105	84	134	107	116	93
'97	123	111	124	113	77	70	120	108	96	87
'98	122	104	127	108	98	84	123	105	137	116
'99	127	98	126	97	120	93	134	104	125	97
1800	135	96	115	82	168	119	122	87	101	72
1801	139	99	139	99	167	119	134	95	108	77
'02	137	125	119	108	125	114	102	92	83	76
'03	144	115	118	94	182	146	124	100	128	103
'04	147	124	116	98	152	128	115	97	105	89
'05	161	122	118	89	146	111	131	100	135	102
1806	169	130	123	95	136	105	132	101	131	101
'07	152	118	116	90	168	131	125	96	113	88
'08	155	107	113	78	253	175	166	115	116	80
'09	159	101	114	73	533	340	162	103	110	70
'10	142	100	99	70	300	211	141	99	157	111
1811	148	109	106	78	381	281	136	100	107	79
'12	118	98	88	73	306	254	120	99	91	75
'13	111	97	81	71	185	161	115	100	82	71
'14	113	99	77	68	197	172	113	99	132	116
'15	115	105	81	74	161	148	114	104	106	97
1816	96	105	71	78	116	127	82	90	68	75
'17	107	92	78	67	115	99	124	106	86	73
'18	119	91	98	75	134	102	129	98	95	72
'19	113	101	104	93	138	124	100	90	80	72
'20	106	103	95	92	113	110	105	101	69	67

Note.—The *actual* variation is shown by the average proportion of gold prices in each year to the gold prices of 1782. The *comparative* variation is the ratio in which the prices of each commodity or group of commodities have risen or fallen more than the whole forty commodities.

VIII.—*Proportional Variation of Prices—Contd.*

Year.	Metals. Copper, Lead, Tin, Iron.		Iron. Several Varieties.		Timber.		Oils.		Dye Materials.	
	Actual.	Comparative.	Actual.	Comparative.	Actual.	Comparative.	Actual.	Comparative.	Actual.	Comparative.
1821	101	107	82	87	116	123	89	94	74	78
'22	100	113	74	83	101	115	93	105	89	101
'23	107	121	78	88	137	155	85	96	96	108
'24	108	123	94	106	126	143	78	88	83	94
'25	123	119	114	110	133	129	86	84	98	95
1826	111	124	100	111	107	119	81	90	70	79
'27	103	114	86	96	95	105	82	90	73	81
'28	95	117	80	98	93	115	75	92	61	75
'29	89	113	72	91	101	128	78	98	59	75
'30	81	100	66	82	98	121	86	106	56	69
1831	80	98	63	77	104	126	90	110	49	59
'32	77	99	61	78	108	139	79	101	47	60
'33	82	109	65	87	106	141	79	105	43	57
'34	87	112	65	83	106	137	75	96	47	61
'35	90	111	64	79	116	145	78	97	48	60
1836	114	132	86	100	126	146	93	108	46	53
'37	97	116	74	89	119	142	89	107	49	59
'38	96	114	77	92	111	132	92	109	52	62
'39	94	102	77	83	111	120	92	100	59	64
'40	87	100	63	72	—*	—	91	105	47	54
1841	90	106	61	71	113	133	97	115	40	47
'42	80	107	51	68	113	151	96	127	33	44
'43	71	100	43	61	85	120	89	125	36	51
'44	74	107	43	63	84	122	79	114	34	50
'45	86	117	59	80	96	130	84	114	35	48
1846	90	121	60	81	90	122	86	116	36	48
'47	90	115	60	76	91	116	99	127	35	45
'48	77	113	47	69	84	124	95	141	30	45
'49	73	114	40	63	72	112	96	150	28	44
'50	74	115	37	58	66	103	91	142	30	46
1851	73	112	36	54	68	103	90	137	31	47
'52	80	124	40	63	62	96	84	130	31	48
'53	103	138	53	72	81	109	95	128	37	50
'54	109	131	60	72	87	105	121	146	38	46
'55	104	130	51	64	88	110	117	146	31	38
1856	109	132	55	66	78	95	110	134	35	42
'57	108	127	51	60	84	99	113	133	36	43
'58	96	127	46	62	69	92	96	127	36	48
'59	97	127	42	55	70	92	101	132	32	42
'60	95	121	40	51	70	88	105	132	32	40
1861	88	112	37	47	69	89	111	142	32	41
'62	85	107	35	44	72	90	113	142	35	44
'63	85	108	37	47	74	95	107	137	34	43
'64	92	117	44	57	73	94	98	125	35	45
'65	81	105	39	51	74	96	90	115	34	44

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* Uncertain from interference of customs duties; the uncertainty extends to the succeeding in relation to the preceding numbers.

VIII.—*Proportional Variation of Prices from* 1782.

Year.	Fibres. Cotton, Wool, Silk, Flax.		Cotton. Several Varieties.		Corn. Wheat, Barley, Oats, Rye, Beans, Peas.		Wheat. " Gazette " Average.		Fodder. Hay, Clover, Straw.	
	Actual.	Comparative.	Actual.	Comparative.	Actual.	Comparative.	Actual.	Comparative.	Actual.	Comparative.
1782	100	100	100	100	100	100	100	100	—	—
'83	112	111	102	102	127	126	110	110	—	—
'84	93	101	61	66	116	126	102	110	—	—
'85	107	118	84	93	104	115	88	97	—	—
1786	108	128	86	101	105	124	81	96	—	—
'87	107	123	91	105	102	117	86	99	—	—
'88	107	123	96	110	99	114	94	108	—	—
'89	93	110	57	67	105	123	107	126	—	—
'90	90	115	66	77	117	136	111	129	—	—
1791	96	109	64	72	112	126	99	111	—	—
'92	109	117	81	87	110	118	87	94	—	—
'93	103	105	76	77	129	131	100	101	—	—
'94	88	90	68	70	140	144	106	109	—	—
'95	103	89	79	68	168	144	152	131	—	—
1796	126	101	115	92	153	123	160	128	—	—
'97	118	107	92	83	112	101	109	99	— *	— *
'98	130	111	139	118	116	99	105	90	118	100
'99	172	133	204	157	159	122	140	108	171	132
1800	143	102	116	82	252	179	231	164	235	167
1801	142	101	114	81	232	165	222	159	244	174
'02	132	120	94	86	130	118	131	119	164	149
'03	149	120	86	69	123	98	116	93	230	185
'04	149	125	86	73	134	113	123	104	191	161
'05	155	118	100	76	177	134	177	134	162	123
1806	144	111	93	71	158	122	156	120	181	139
'07	150	117	85	66	168	131	149	115	233	181
'08	168	116	105	73	195	135	160	111	230	159
'09	214	137	103	65	205	131	192	123	214	137
'10	165	116	86	60	175	124	187	132	242	171
1811	149	110	66	49	167	123	178	131	308	228
'12	147	122	70	58	221	183	209	173	203	169
'13	134	117	83	72	197	172	172	150	182	159
'14	131	114	111	97	123	108	113	99	167	146
'15	138	126	94	86	114	104	111	101	166	152
1816	106	116	87	96	123	135	132	146	222	244
'17	140	120	110	94	192	165	191	164	224	192
'18	161	122	106	80	203	155	170	129	252	192
'19	118	105	67	60	177	159	144	129	254	228
'20	121	117	61	60	148	144	134	130	171	166

* Quotations of fodder previous to 1797 were wanting ; the ratios were therefore made to commence from the general average of all commodities for 1797.

VIII.—*Proportional Variation of Prices—Contd.*

Year.	Fibres. Cotton, Wool, Silk, Flax.		Cotton. Several Varieties.		Corn. Wheat, Barley, Oats, Rye, Beans, Peas.		Wheat. " Gazette " Average.		Fodder. Hay, Clover, Straw.	
	Actual.	Comparative.	Actual.	Comparative.	Actual.	Comparative.	Actual.	Comparative.	Actual.	Comparative.
1821	112	119	53	56	116	123	114	121	182	193
'22	110	125	47	53	92	105	90	102	170	193
'23	115	129	46	52	125	140	108	122	215	243
'24	103	116	48	54	147	167	130	147	250	283
'25	121	117	63	61	157	152	139	135	—	—
1826	86	96	40	45	152	169	119	132	—	—
'27	86	95	38	42	155	171	119	131	245	271
'28	83	102	34	42	136	168	123	151	197	243
'29	76	95	41	39	135	171	134	169	180	228
'30	78	96	36	45	138	171	130	162	220	274
1831	87	106	33	40	150	182	135	164	199	242
'32	82	105	35	45	130	166	119	152	210	269
'33	89	118	43	58	119	158	107	143	169	224
'34	106	136	48	62	123	158	94	121	177	228
'35	116	145	55	69	119	148	80	99	218	271
1836	111	129	53	62	131	152	98	114	185	215
'37	97	116	40	48	132	158	113	136	228	272
'38	91	108	38	46	134	160	131	156	211	252
'39	96	104	41	44	155	168	143	155	234	254
'40	92	106	36	41	150	173	135	155	200	230
1841	88	104	37	44	140	166	131	154	227	267
'42	77	103	31	41	120	160	116	155	210	280
'43	72	102	27	37	113	159	102	143	221	311
'44	79	114	27	39	125	180	104	150	173	251
'45	81	110	24	33	130	176	103	140	233	316
1846	83	112	28	37	140	188	111	149	200	269
'47	77	98	29	37	176	224	142	181	180	230
'48	61	90	21	31	125	184	103	151	173	256
'49	62	96	23	36	106	166	90	140	177	277
'50	76	119	32	50	94	146	82	127	156	243
1851	77	117	27	41	98	150	78	119	163	248
'52	76	118	25	39	109	169	83	128	176	273
'53	77	104	24	33	127	170	108	146	189	254
'54	75	90	24	30	157	189	147	177	226	272
'55	75	94	26	32	154	193	151	189	217	272
1856	89	108	30	36	151	184	140	170	221	268
'57	98	116	36	43	142	168	114	135	191	225
'58	87	115	32	43	128	169	90	119	194	257
'59	97	127	33	43	125	163	89	116	198	258
'60	95	121	30	37	136	172	108	137	214	271
1861	96	122	39	50	135	172	113	144	213	272
'62	111	140	82	104	131	165	113	142	210	264
'63	127	161	117	150	119	152	91	116	199	254
'64	129	164	128	164	109	139	81	104	199	254
'65	120	155	77	100	107	138	78	101	229	295

IX.—*Description of the Diagrams.*

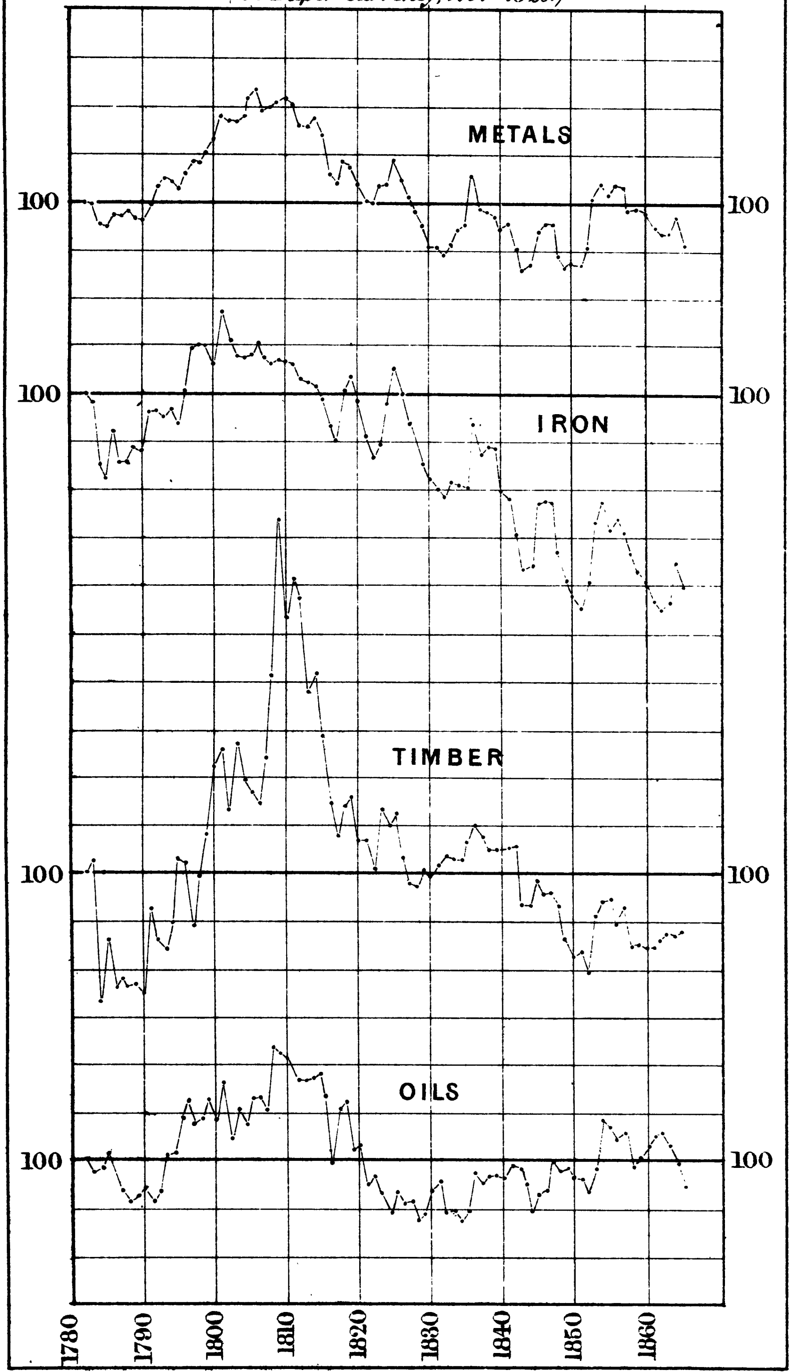
Each point on a curve has been laid down at a distance from the thick zero line, representing a ratio of prices of the year to the prices of 1782, on the scale of one quarter of an inch to the logarithm ·100. The horizontal reference lines represent, from below upwards, the logarithms $\bar{1}\cdot500$, $\bar{1}\cdot600$, $\bar{1}\cdot700$, $\bar{1}\cdot800$, $\bar{1}\cdot900$, 0·000, 0·100, 0·200, 0·300, &c. Since the logarithm of 2 is nearly ·300 (·30103) and that of $\frac{1}{2}$, $\bar{1}\cdot700$, the third line above the zero line represents a *doubled* price, the third line below it a halved price.

In the case of the general variation of all the commodities, horizontal lines representing the ratios in common numbers have been substituted for the logarithmic lines, the logarithmic scale however being preserved.

The diagrams are intended only to show the general character of the variations, the numerical results being given in the tables. It has not been thought needful to draw out the comparative variations except in a few cases.

PROPORTIONAL VARIATION OF PRICES

(in Paper Currency, 1797-1820.)



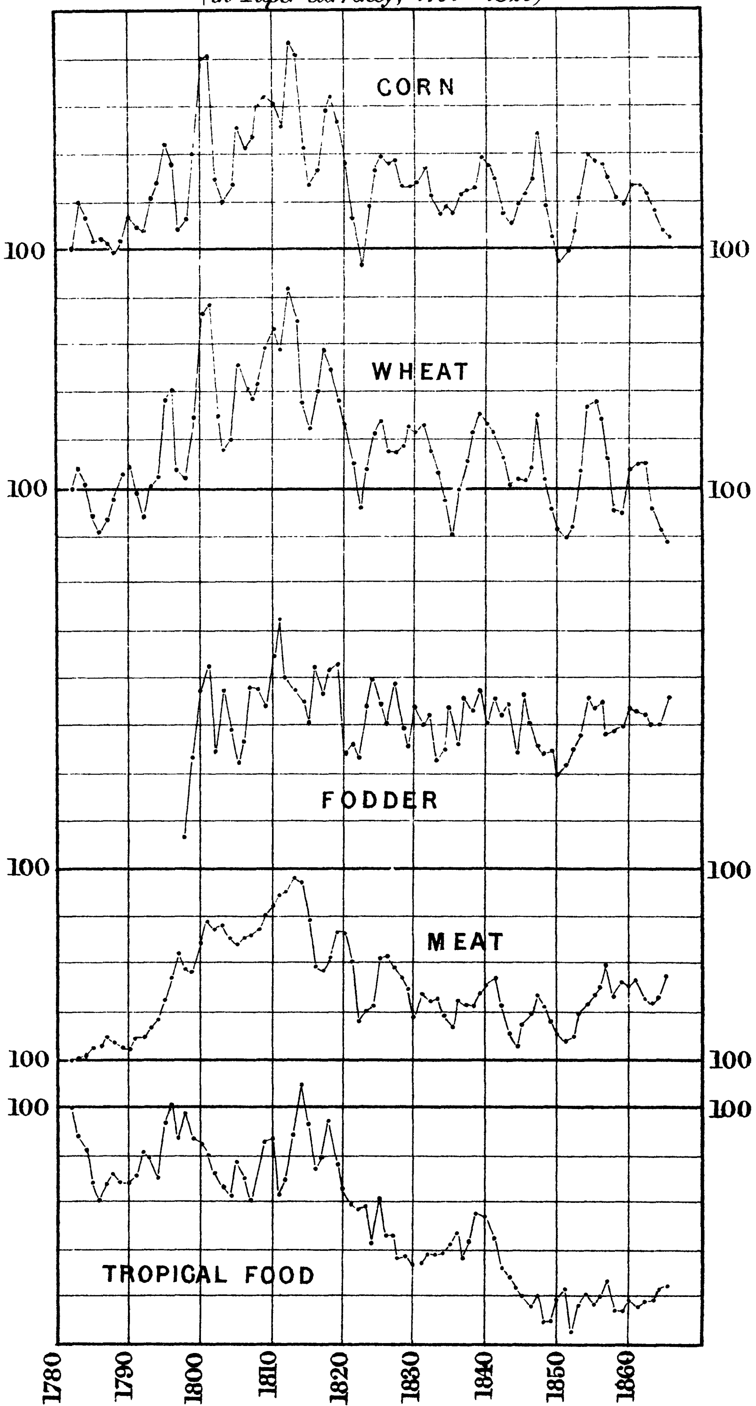
Harrison & Sons

See description and Tables.

St Martin's Lane

PROPORTIONAL VARIATION OF PRICES

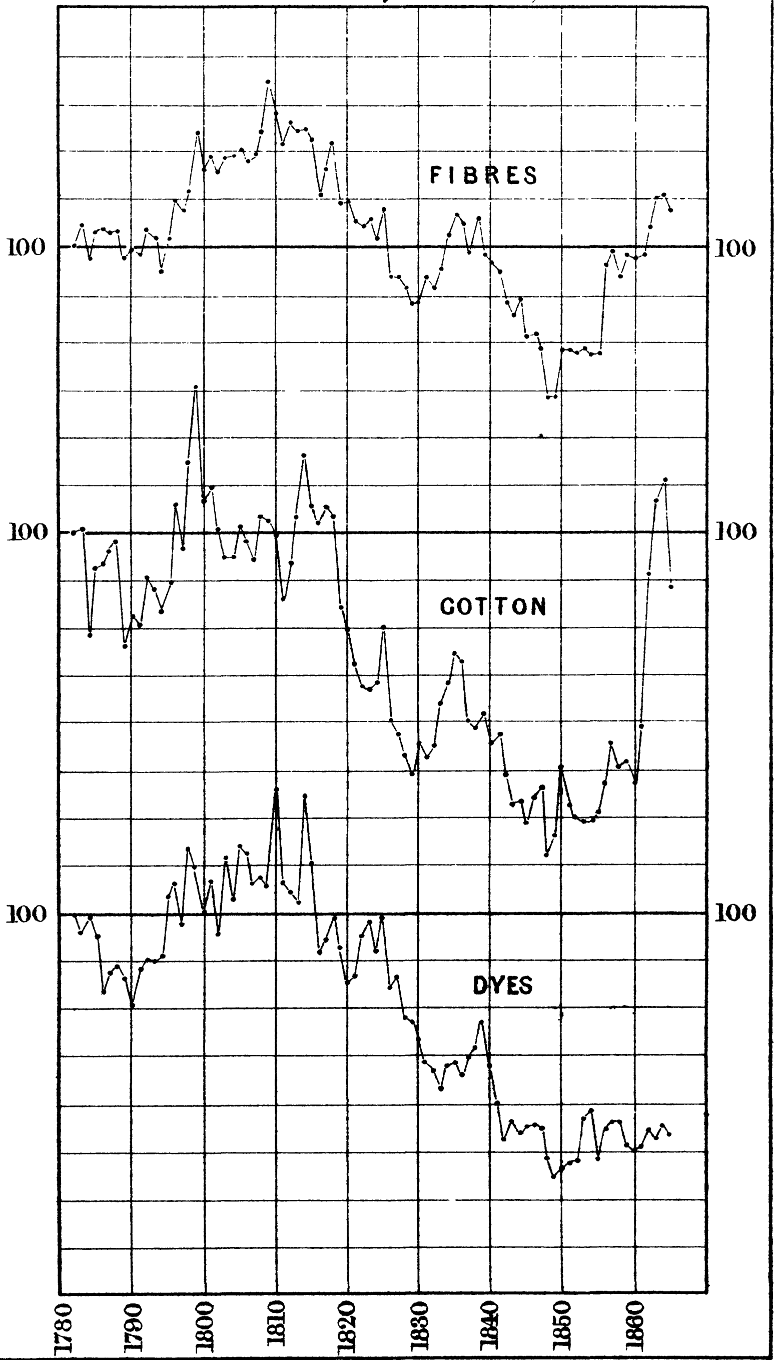
(in Paper Currency, 1797 - 1820)



See description and Tables.

PROPORTIONAL VARIATION OF PRICES.

(in Paper Currency, 1797- 1820)



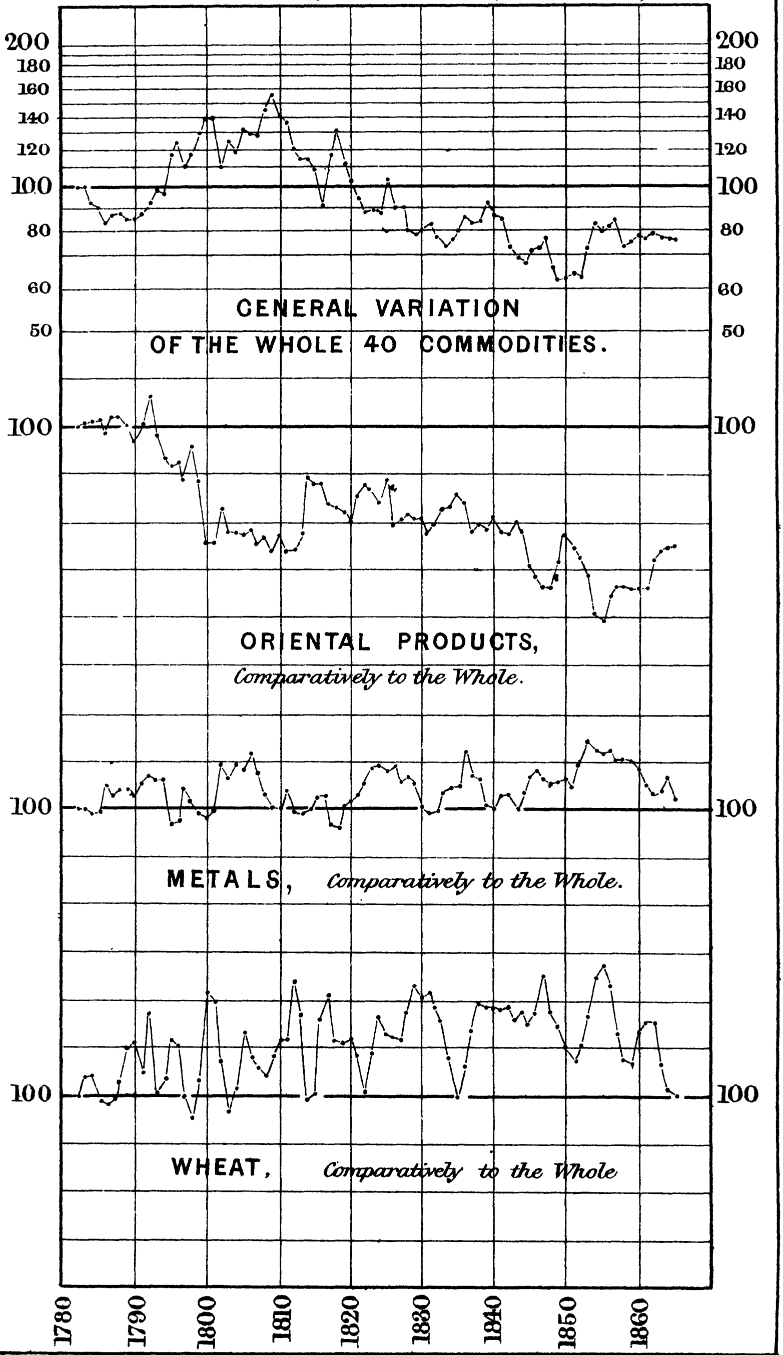
Harrison & Sons

See description and Tables.

St Martins Lane

PROPORTIONAL VARIATION OF PRICES

(Corrected for depreciation of Paper, 1797-1820)



Harrison & Sons, *See description and Tables.* S^t Martins Lane